

REMARKS

Elected claims 1-5 have been cancelled without prejudice or disclaimer and non-elected claims 6-17 have been withdrawn from further consideration. New claims 18-20 have been added in substitution for cancelled claims 1-5 and comprise the only claims now under consideration in this application. For the reasons to be hereinafter indicated, it is respectfully urged that claims 18-20 should be allowable.

The rejection of original claims 1, 2, 4 and 5 under 35 USC 102(b) as being anticipated by the Ogino U.S. patent 5,753,995 and the rejection of claim 3 under 35 USC 103(a) as being unpatentable over Ogino in view of the Thompson U.S. patent 3,523,288, are respectfully traversed as being improper and should be withdrawn for the reasons to be hereinafter detailed.

By way of background, carbon brush wear indicators are well known and of varied configurations, such as exemplified by the cited Ogino and Thompson patents. These known devices are generally complex, particularly with respect to the sensing unit which closes an electric circuit and activates a warning signal when the carbon brush has been worn to a predetermined level. These known indicators are also expensive to manufacture due to their complexity. The present invention overcomes the complexity and expense of known indicators by providing an improved sensing unit which is simple in construction, inexpensive to manufacture and reliable in use.

The novel sensing unit of this invention includes a hole formed through a wall of the brush holder, which is preferably defined by a copper barrel, an insulated plug disposed within the hole, and a springy tongue, preferably formed of springy copper, extending through a midsection of the insulated plug, with the tongue having a first free end extending into the brush holder for contact by a spring urging the brush against a rotor of a motor and a second end connected to a premonitory circuit for producing a warning signal when the spring contacts the free end.

Neither Ogino or Thompson, considered individually or collectively, suggests or discloses the novel sensing unit for a carbon brush assembly, particularly as now claimed by applicant.

The Ogino patent discloses a device for indicating wear on a motor brush when a brush spring 46 engages a contact 33 to close an inductor circuit and actuate a warning indicator. The present invention functions in a similar manner but, aside from this functional similarity, there is no structural similarity between the Ogino device and that claimed by applicant.

Ogino teaches a complex device which is necessarily more expensive to manufacture than that of the present invention. The Ogino device requires a metal terminal 30 which "is formed into a complicated configuration" defined by a pair of engaging fins 31 and 32, a contact 33 provided at a tip of a lever 34, and a pair of contacts 35 and 36. This structurally complex terminal 30 is secured onto an assembly that includes a resin cylindrical body 21 within which a brass holder shank 22 is assembled. Body 21 is provided with an indentation 25 within which terminal 30 is engaged and shank 22 is provided with a slot 23 through which contact 33 extends and faces the interior of shank 22 for engagement by brush spring 46.

By contrast, the structure of the present invention is extremely simple in design, inexpensive to manufacture and provides a reliable indication of motor brush wear. This is achieved by forming a hole through a wall of a copper barrel within which a carbon brush is movably disposed and urged by a spring into engagement against a rotor of a motor. An insulated plug is disposed within the hole and a springy tongue extends through a midsection of the insulated plug. The tongue includes a first end extending into the copper barrel for contact by the spring and a second end for connection to a premonitory circuit for producing a warning signal when the circuit is closed due to contact of the spring with the tongue. Thus, it is clear there is no similarity between the complex Ogino device and the simple structure claimed for the present invention. Accordingly, it is respectfully urged that the rejection based on the

Ogino patent should be withdrawn in view of the invention as presently claimed by applicant.

The Thompson patent discloses a brush wear indicator wherein a brush 30 disposed within a metallic tube 32 is urged by a spring 33 into contact with a commutator 28. A resilient indicator switch urges a slide pin 43 through tube 32 in constant engagement with brush 30. Activation of the indicator circuit occurs when pin 43 drops into a hole 49 formed in the side of brush 30 at a predetermined location to signal the extent of brush wear.

It is important to note that there is no contact between pin 43 and spring 33 of this device. In fact, the hole 49 is formed in brush 30 for the specific purpose of avoiding accidental contact between pin 43 and spring 33 (note column 5, lines 32-36). Thus, both the structure and function of the Thompson device teach away from those of the present invention.

Accordingly, since the Ogino patent discloses a complicated indicator structure bearing no resemblance to that of the present invention, there would be no motivation for one of ordinary skill in the art to modify the Ogino indicator by utilizing the slide pin 43 of the Thompson patent, particularly since the latter patent teaches away from the function of the present invention. It is submitted that the combination of Ogino and Thompson in the manner proposed by the Examiner could not have been realized in the absence of a hindsight analysis of the present invention.

For these reasons, it is respectfully urged that the rejection based on the combination of Ogino and Thompson be withdrawn. The Examiner will note the present invention is now precisely and definitively recited by new claims 18-20, which are believed to clearly and patentably distinguish over the applied references and should now be in condition for allowance.

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If the Examiner should have any questions concerning this matter, the undersigned may be reached at his Alexandria, Virginia office at 703 683-0500.

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Respectfully submitted,



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